National and International Policies for Slowing Global Warming

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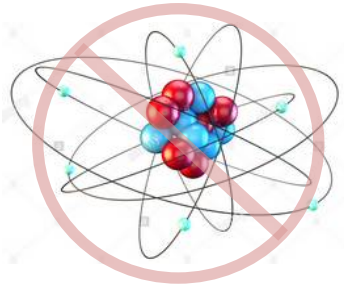
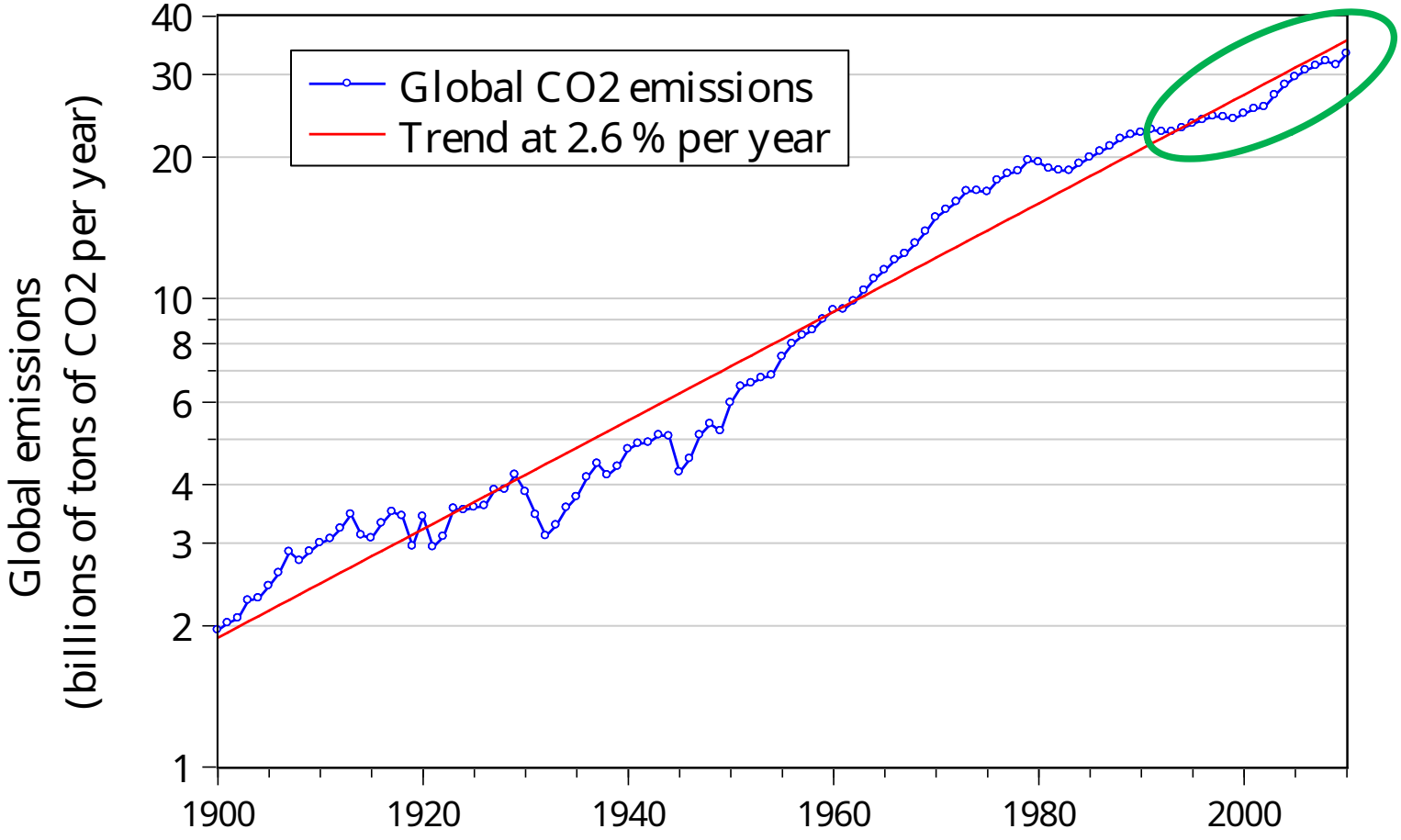


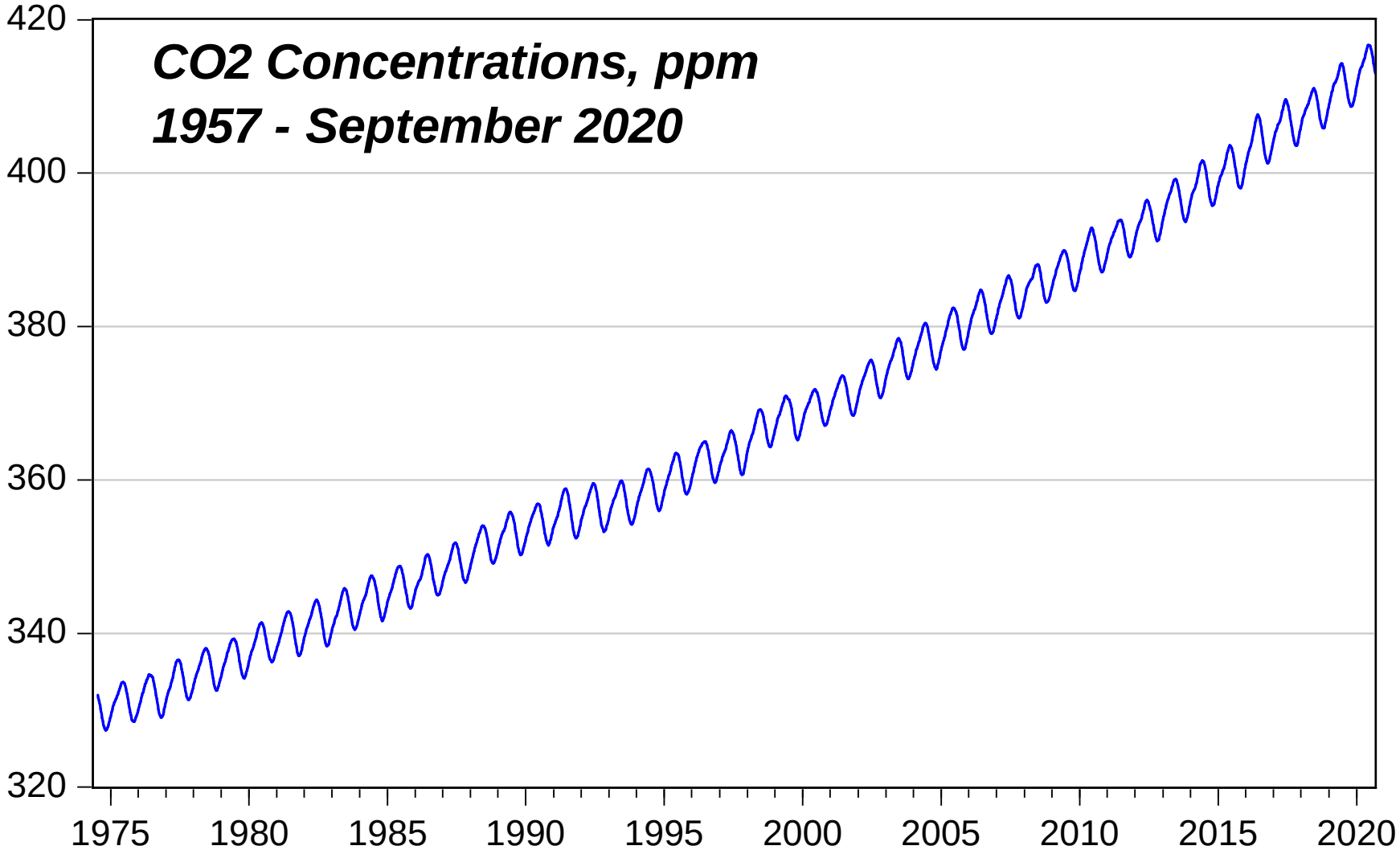
Four key issues for today

1. Very little progress in slowing emissions
2. Particular challenge of incentives for low-carbon technologies
3. Important role of carbon pricing
4. Need to combat international free riding with a climate compact

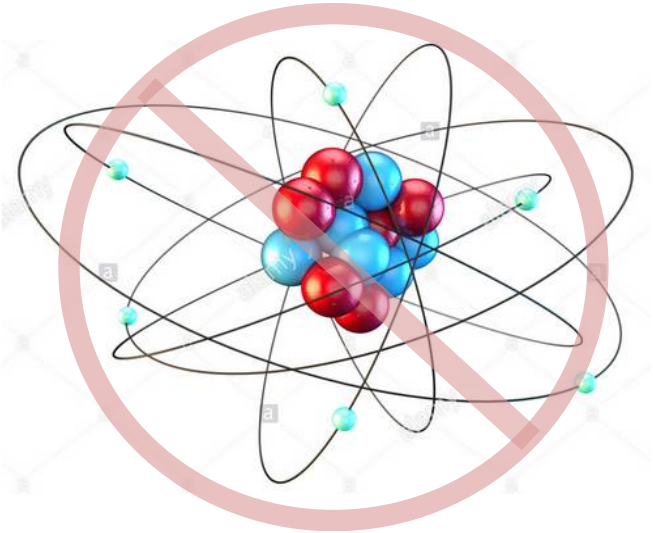
Global CO2 emissions



Has the pandemic slowed CO2 growth?



Role of Economics in Climate Policy



Key Economic Insights (1): Inadequate investment in low-carbon technologies

- Innovation has big spillovers
- Public return on innovation many times larger than private returns
- But even worse: there is double externality for low-carbon innovations:
  - innovation externality
  - climate impacts externality
- Policy requires fixing climate externality (next slide) and special incentives for low-carbon technologies

Key Economic Insights (2): Harmonized Carbon Prices

- High price on CO_2 emissions is the key to sharp emissions reductions.
- Level of price should be harmonized to meet climate target (such as cost-benefit optimum or 2 ˚C temperature target)
- However, in reality, prices are fragmented and very low.

The carbon price landscape, 2019

Region	Percent of region covered by price	Carbon price ($/tCO2)	Effective price ($/tCO2)	% of global emissions
Sweden	40	127	50.8	<1
Norway	60	59	35.4	<1
Switz	33	96	31.7	<1
BC	70	26	18.2	<1
France	33	50	16.5	1
Calif	85	16	13.6	2
ETS	43	25	10.8	8
Japan	70	3	2.1	5
Argentina	20	6	1.2	<1
Chinese cities	40	3	1.2	1
Northeast US	18	5	0.9	1
Mexico	45	1	0.5	1.5
Uncovered	100	0	0.0	80
Global average			**1.7**	

Key Economic Insights (3):
The Global Free Rider Problem

After 30 years, international policy is at a dead end.

Why? Climate change policy is hampered by ***the free rider problem:***

- The agreements are voluntary.
- So there are no penalties for (costly) non-participation
- Countries talk loud and carry no stick.

Verdict based on actual carbon prices today and minimal emissions reductions.

A Climate Compact to Overcome Free-Riding

New proposal is a club structure, or climate compact.

Club structure has privileges and obligations.

Proposal here involves a regime with two features:

- Target carbon price, perhaps $50 per ton CO_2
- Penalty tariff on non-participants, say 3% penalty tariff

Modeling at Yale suggests that this could be effective way to combat free-riding

Summary

1. Low-carbon technologies plagued by double externality
2. Key policy is to have high and harmonized carbon prices.
3. Strong incentive-compatible agreements can be supported with climate compact: mandatory carbon-price policies plus tariff penalties for non-participants.